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A

PROGRESSIVE COURSE

OF

INVENTIVE DRAWING

ON THE

PRINCIPLES OF PESTALOZZI,

FOR

THE USE OF TEACHERS AND SELF-INSTRUCTION;

ALSO WITH A VIEW TO ITS ADAPTATION TO

ART AND MANUFACTURE.

BY

WM. J. WHITAKER,

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First Course.

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TO

HERMANN KRUSI

(SON OF THE FIRST COADJUTOR OF THE VENERATED PESTALOZZI),
FROM WHOM I RECEIVED THE FIRST PRINCIPLES OF THIS COURSE OF INVENTIVE
DRAWING, AND TO WHOSE KINDNESS I AM INDEBTED FOR
MANY VALUABLE LESSONS IN THE TRUE SCIENCE
OF EDUCATION,

THIS LITTLE WORK

IS VERY AFFECTIONATELY DEDICATED BY HIS SINCERE FRIEND AND
FELLOW-WORKER,

WM. J. WHITAKER.

20, Clifton Place, Washington-street,
Boston, Oct. 13, 1851.

DEFINITION
OF
GEOMETRICAL FORMS

USED IN THIS COURSE OF DRAWING.

An Angle is formed by the junction of two lines.

A Right Angle is obtained by drawing one straight line perpendicular on another.

An Acute Angle is that which is less than a right angle.

An Obtuse Angle is that which is greater than a right angle.

A Triangle is a space enclosed by three lines.

A Right-angled Triangle is that which has a right angle.

An Acute-angled Triangle is that which has three acute angles.

An Obtuse-angled Triangle is that which has an obtuse angle.

A Four-sided Figure is a space enclosed by four lines.

A Square is that which has all its sides equal, and all its angles right angles.

An Oblong, or Rectangle, is that which has all its angles right angles, and its parallels equal.

A Rhomb is that which has all its sides equal, but its angles are not right angles.

A Rhomboid is that which has its parallels equal, but its angles are not right angles.

A Parallel Trapezium is that which has two sides parallel and two divergent.

A Trapeziod is that which has no parallel sides.

A Circle is a curved line enclosing a space, and at equal distance in all points from the centre.

An Arc is any part of a circle.

ANGLES.

TWO-SIDED FIGURES

CURVILINEAR TRIANGLES.

FOUR SIDED FIGURES.

1st Class.

2nd Class.

3rd Class

INTRODUCTION.

THE author of this Course of Inventive Drawing addresses himself especially to the teacher, the object being to guide him in his efforts to develop a correct power of drawing and design. This can, in our opinion, be done only by cultivating the inventive faculties, making the children produce a series of figures of their own invention, thus combining a correct knowledge of form with tasteful application. The teacher, in placing his own figures before the pupils, making them objects of imitation, would miss the most interesting feature in the lessons intended to be conveyed. The system has been tried with children of the poorest class, previously ignorant of drawing. The *gradual* development of their powers increased their interest, and led them at each succeeding step to discover that they could create forms surpassing all their previous irregular efforts. A moment's consideration will show, that, when correctness of eye accompanies inventive talent, the development of

better taste will introduce into our manufactures a spirit of design more worthy of execution, and calculated to increase our comforts by surrounding us with articles of utility, beautiful in form and construction, at very little more cost than the clumsy productions we sometimes see around us.

Drawing is essential to all good education, and eminently useful in every branch of manufacture and art. It aids the artisan in carrying out the productions and designs of the man of science, and cannot fail to make him better understand the end for which he labors. The art of designing will be much more appreciated, when, in the primary and other schools, steps are taken to develop the fundamental principles of form, in connection with correct expression and ingenuity of combination. This will never be accomplished by copying alone. Sir Joshua Reynolds has said, that "copying is only a delusive kind of employment," and there is much truth in the statement; for it certainly is not calculated to awaken thought or expand the mind; and employments which have not such a tendency can scarcely be called substantial or useful. It is by copying so much, and neglecting to create for ourselves, that we are not equal to other nations in originality and purity of design. If we would be truly great in any thing, we must start from the first elements, and by gradual steps reach excellence and perfection.

Schelling, the great German philosopher, says, "Every product of art must, for the sake of clear perception, be analyzed into its separate elements, though the finished whole represent but one harmonious idea. We then see how it rises out of the depths of our imagination, by first tracing and defining its limits, and afterwards developing an infinite richness of form, combined in a tasteful whole, which is presented to the soul of man."

We propose arranging the following Lessons in Elementary Design in two courses.

The aim of the *First* will be the development of simple forms, and their elementary combinations with straight and curved lines.

The aim of the *Second* will be the development of perspective on the inventive principle, with a view to its application to the arts and manufactures.

FIRST COURSE
OF
INVENTIVE DRAWING

BASED UPON FORM.

FIRST PART.

Exercises with Straight Lines.

ALL drawing may be reduced to the simple element of the line, either straight or curved.

A straight line describes the shortest distance from one point to another, and alway follows the same direction.

At the first step the child must begin with the easier of the two, — the straight line.

Directions of the Straight Line.

A straight line can be either vertical, horizontal, or slanting.

It is important to draw from the pupil a clear idea of the properties of the straight line. For instance, the teacher may hold up a string with a weight attached to it, and impress this on the children as indicating the ver-

tical direction. By hanging the string over the black-board, and drawing a line parallel to it, he produces a vertical line, and then directs their attention to outlines of objects which follow this direction. Having clearly realized the idea, let them draw a number of vertical lines on their slates.

The horizontal direction is illustrated by the surface of water, or the equally poised beam of a balance. After the children have pointed out such lines in the objects around them, they draw a number of horizontal lines on their slates.

To illustrate the slanting or oblique line, let the teacher hold a pointer in his hand; and, turning it round before his class, avoiding the vertical and horizontal directions, lead them to observe, that the slanting line may incline more or less to the right or the left.

THE PRINCIPLES OF COMBINATION.

To combine accurately the simple lines above described, the power of drawing each correctly is acquired and augmented with the successive exercises.

The varying ages and capacities of the children forming the class demand care on the part of the teacher, in order to watch and guide their power of combination. The constructive process ought naturally to precede the analytic one; whereby we observe that a child with

natural inventive faculties will sometimes create forms, incorrect in their design, whilst another of more observant nature will abstract the outlines of existing objects without proper attention to the laws of taste.

The good teacher endeavors to modify these tendencies, and leads the one to perceive his want of accuracy; the other, his need of more taste in his conceptions. In both, the power of defining in words the figures they have produced must be brought into play.

The youngest children will form the simplest combinations, by placing a given number of sticks on the floor in as many ways as their ingenuity can suggest. It is one of the best amusements the infant teacher can introduce, to let the children successively place the sticks, and afterwards imitate the figures thus formed on their slates. By this exercise, the relation between a tangible form produced by the sticks, and the expression of that form by lines, will be clearly developed in their minds.

We introduce here a lesson on the combination of two lines, supposing the children before us to be from six to eight years of age.

Lesson on the Combination of Two Lines.

Teacher. I wish to have two lines drawn on the black-board: who will come, and do it nicely?

A child comes and draws two lines, — perhaps parallel perpendicular.

Teacher. Who can draw two differently?

A child may draw parallel, horizontal, or slanting lines.

Teacher. Now, suppose you make one line touch another.

This the children can do in three ways, by leaving a greater or less space between the lines. He may also lead them to find more combinations, as lines crossing each other, &c. Having let them exhaust these combinations, he must draw their attention to the difference between each figure; and, eliciting their remarks about lines at equal distances from each other, may give the word "parallel," and apply to all the figures where it occurs.

The word "angle" may likewise be given to some of the combinations; and, after comparing them with each other, the names, "right, acute, and obtuse angles." The remainder of the figures produced may also be described in a similar way.

Combination of Three Straight Lines.

The teacher, after telling the children to place three lines in various positions, will copy the combinations on the blackboard, and require them to be described as in the preceding lesson. The triangles will, in all probability, be produced; he will then endeavor to elicit the

idea that they enclose a space, show the difference between them, and apply their distinctive names, as "right-angled, acute-angled, obtuse-angled triangles."

A fresh impulse may be given to the lesson by leading the pupils to discover how many letters of the alphabet may be formed by the combination of three lines, as **A H K Y Z F N T**. Most likely, the children, and especially the less-gifted ones, will produce irregular and badly executed designs: it is, therefore, important that accuracy and neatness be required. Their eye must be educated to symmetry, and the most tasteful designs held up as the best; whilst the careless and disproportioned figures are brought before the class only to let them discover their defects.

Combination of Four Straight Lines.

This combination leads to a new feature in the exercise, namely, the application of inventive drawing to the representation of simple objects in nature. But, on entering this path, the teacher must guard against being too severe in what might be called a violation of the laws of perspective, if the child should attempt to produce something that is meant to resemble an object. He is rather to consider such an attempt as a rough and *unfinished* outline that will afterwards be corrected with the assistance of perspective brought in on a higher step.

This, however, will limit the designs of this first course to be either the representation of rough outlines or flat surfaces, rejecting all regular indications of breadth and thickness.

After collecting the most common combinations with four lines, by which some more of the letters of the alphabet are produced, &c., the teacher may draw on the board a few figures to illustrate the object just mentioned.

The quick perception of the children will discover the tendency of the hint, and will rapidly produce many other outlines of material objects, and of four-sided figures enclosing a space, as the square, oblong, rhomb, trapezium, &c. These must be particularly dwelt upon, and their respective qualities described.

Before giving the graduated series of combinations with straight and curved lines, a few hints on the management of a large class may be acceptable to the instructor.

HINTS FOR THE PROPER MANAGEMENT OF THE SUBJECT IN A LARGE CLASS.

The teacher calls several children, that is, one child after another to the blackboard; and, having specified the combination, lets the child draw its own design. When the board is full, — which will soon be the case, —

the teacher effaces the whole, and desires the class to draw as many of the combinations as they can recollect on their own slates, together with new combinations which were not there before. After a little time, he selects from the slates the best designs, and presents them again to the whole class, neatly drawn on the blackboard; pointing out why certain figures are the best, and putting such questions as will illustrate the parts of the designs, eliciting their proper names and definitions. He may also bid the children, especially the less talented ones, copy correctly the best of the new designs. The reward of a blank piece of paper, with permission to bring from home more and better designs, is eagerly sought for, and excites a spirit of emulation and industry. It is needless further to illustrate lessons on the combinations to be produced by simple straight lines. The teacher may prolong and vary such exercises according to the requirements of his class. He may possibly be more successful with children than older pupils, because the former enter with more spirit into this congenial mode of occupation. Childhood is the age when the power of combination is most active. To direct its operations in systematic progression leads to their application to inventive art, and prepares the mind for original conceptions in the higher regions of the arts.

The instructor, who has the cause of education and progress at heart, will attribute a greater value to these

exercises on combination than the mere novelty they may possess; and will, upon a fair trial, perceive a powerful impulse given to the class, not only felt during school-hours, but active everywhere in the contemplation and analysis of every work of beauty, and thus form another link in what may be termed an organic system of education.

ANGLES.

The teacher draws the right, acute, and obtuse angles, leading the class to a definition of all, and a careful comparison of each with the others. When thoroughly understood, let the pupils draw each separately, and then in a graduated form one within the other. When produced with tolerable correctness, proceed to the —

Combination of Two Right Angles.

Here the teacher should draw the attention of his pupils to the mode of combination; it being requisite to prevent the angles from touching each other, as it would increase the given elements. We therefore divide combination into two parts, viz. *relative*, when not touching, as in parallel lines, &c.; *positive*, when in absolute contact. Relative combination is used in the present and succeeding exercises.

EXERCISES.

Combine four right angles.

Combine two acute angles.

Combine four acute angles.

Combine two obtuse angles.

Combine four obtuse angles.

Combine four right and four acute angles.

Combine four right and four obtuse angles.

Combine four right, four acute, and four obtuse angles.

TRIANGLES.

When the combinations of the angles are completed, place those triangles before the pupils, which are distinguished as the right-angled, the acute-angled, and the obtuse-angled triangles; leading them to point out their distinctive parts and qualities.

EXERCISES.

Combine four right-angled triangles.

Combine four acute-angled triangles.

Combine four obtuse-angled triangles.

Combine four right and four acute-angled triangles.

Combine four right and four obtuse-angled triangles.

Combine four right, four acute, and four obtuse-angled triangles.

Combine any number of triangles.

In the last combination, care must be taken to refuse any design whose parts are not clearly defined; and the teacher must check any approach to wildness of composition, which will sometimes creep in, especially among the careless and negligent.

FOUR-SIDED FIGURES.

The teacher, on introducing these figures, must point out to the class, that their character depends on their opposite sides being parallel or divergent, and on the difference of their angles. (See Definitions.)

These figures, when combined, may be applied to various objects, as the flat sides of buildings, wherein we allow some relaxation of the hitherto strictly observed rule of showing the parts separated and distinct, occasionally allowing them to be fitted together.

EXERCISES.

Combine four squares.

Combine four oblongs.

Combine four squares and four oblongs.

Combine four rhombs.

Combine four parallel trapeziums.

Combine four rhombs and four trapeziums.

Combine twelve four-sided figures.

Combine any number of four-sided figures.

Combine any number of three and four-sided figures.

In the last three exercises, no restriction is placed upon the kind of figures combined. Either of the kinds, or all of them, may be used at the discretion of the pupil.

SECOND PART.

COMBINATIONS WITH CURVED LINES.

To introduce the curved line properly, the teacher draws it in its simplest form — viz. the arc — on the blackboard or slate, together with a straight line, in order to draw the attention of the children to the difference between them. They will find by observation, that a straight line always proceeds in the same direction, describing the shortest way from one point to another; while the curved line continually changes its direction.

Again, they will see that the sides of the curved line are very different in character, being concave (a rounded hollow) on the one side, and convex (rounded) on the other, which may be exemplified by some tangible object, as a watch-glass, &c.

Let the pupils draw a number of arcs in different positions, in order to attain correctness in drawing the line itself, and then proceed to combination.

CURVILINEAR ANGLES.

By the combination of two curved lines, three angles are produced (see illustration), the definition of which the pupils must be led to find for themselves, viewing their sides from the interior, viz. the concave, the convex, and the mixed angle.

EXERCISES.

Combine four concave angles.

Combine four convex angles.

Combine four mixed angles.

Combine four concave and four convex angles.

Combine four concave and four mixed angles.

Combine four concave, four convex, and four mixed angles.

Combine any number of curvilinear angles.

The pupils should be told that those designs are best and most beautiful, which show simplicity in their construction, and when the conception can be readily grasped by the observer.

TWO-SIDED FIGURES.

By the combination of two curved lines may be formed two figures enclosing a space, to which we give numbers for the want of distinctive names. (See illustration.)

EXERCISES.

- Combine four two-sided figures, No. 1.
- Combine four two-sided figures, No. 2.
- Combine four two-sided figures, No. 1 and 2.
- Combine any number of two-sided figures.

CURVILINEAR TRIANGLES.

To supply the want of distinctive names for these figures, we number them 1, 2, 3, and 4.

EXERCISES.

- Combine four curvilinear triangles, No. 1.
- Combine four curvilinear triangles, No. 2.
- Combine four curvilinear triangles, No. 3.
- Combine four curvilinear triangles, No. 4.
- Combine four curvilinear triangles, No. 1 and 2.
- Combine four curvilinear triangles, No. 3 and 4.
- Combine any number of curvilinear triangles.
- Combine any number of two and three-sided curvilinear figures.

FOUR-SIDED FIGURES.

When the pupils are called upon to produce these figures, they will soon find several of very different character; the only condition being that the four lines must

enclose *one* space. The angles in this series of figures will not always be found inside, but frequently outside ; and the teacher may lead his class to arrange them into the different orders, as — First, Figures with all their angles inside. Second, Having part or all of their angles outside.

While going through this course of graduated exercises, the pupils will, in all probability, have acquired boldness of execution, and will naturally be induced on this step to give some of their lines a softer and more undulated appearance, which must not be checked, as it is a manifestation of correct taste. Thus a third class of figures may be produced. (See illustration.)

As the powers of combination will have considerably increased, the teacher may cease to limit the number of figures to be combined, making the remainder of the exercises unlimited as to number, restricting them only to forms.

EXERCISES.

Combine any number of four-sided figures.

Combine any number of two and four-sided figures.

Combine any number of three and four-sided figures.

As a concluding exercise, we give the combination of any number of two, three, and four-sided curvilinear

figures, which will well test the efficiency and progress of the pupils, both in execution and design.

If well directed, they will produce many combinations, rich and varied in character, considering the limited material given as a foundation; and the conceptive faculties will have received a powerful impulse in the right direction, viz. a longing for the Beautiful and True, both in Nature and Art.

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